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## ABSTRACT OF THE DISCLOSURE

A reciprocating machine such as a vacuum pump includes a cylinder in which a reciprocating piston is disposed for reciprocating movement. A variable voltage driver is provided for driving the piston and a vibration sensor is provided for sensing contact between the piston and ends of the cylinder. A controller interconnects the sensor and driver to control movement of the driver and piston to maximize piston stroke and reduce if not eliminate contacting of the piston with the cylinder.